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Tropical Ecology and Society
Reconciliating Conservation and Sustainable Use of Biodiversity

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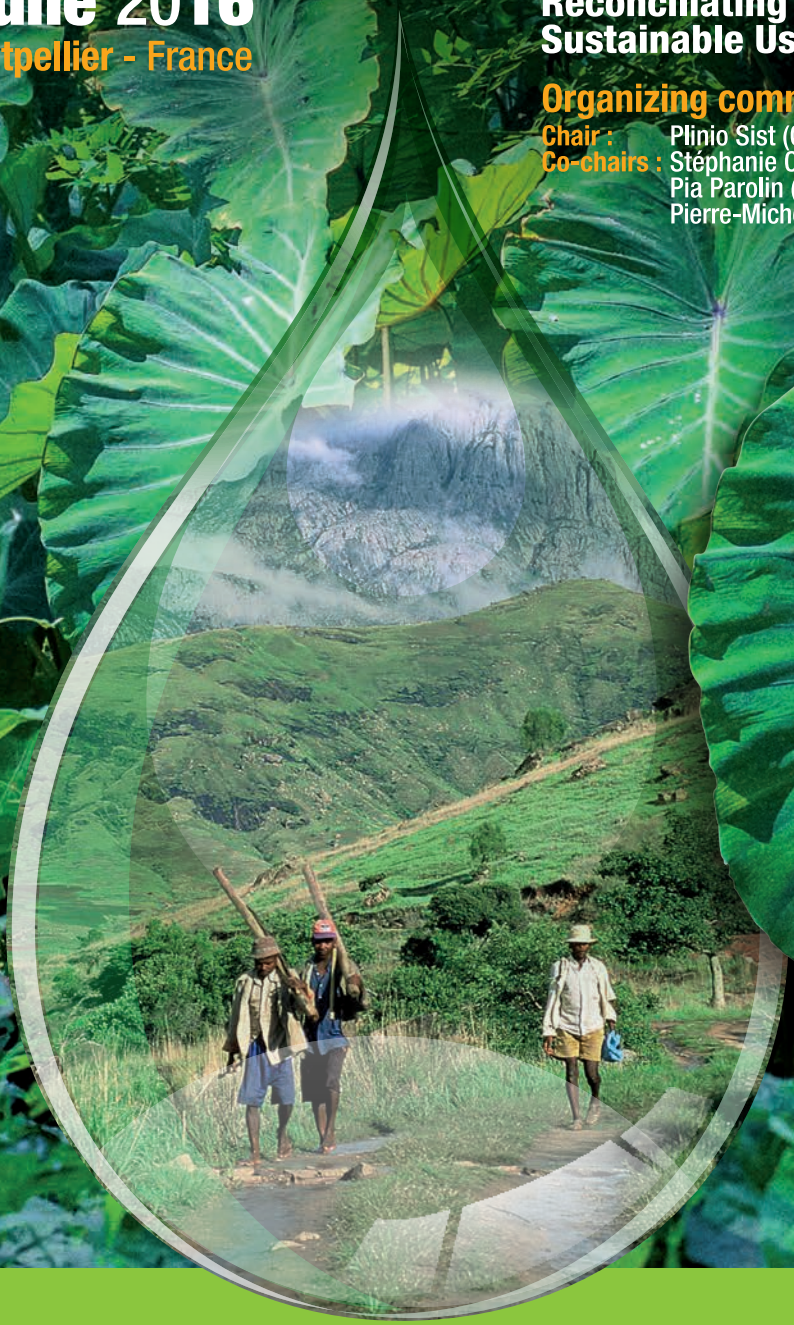

PROGRAM & ABSTRACTS

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P60-03 – S60 *Management impacts on biodiversity and carbon/nutrient balances in the tropics*
17:30 – 18:30 – Joffre Area (Level 1)

Are grasslands green?

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Background: Soil Organic Carbon storage is an important global C sink. The *Imperata* grasslands of the tropical region are a vast underutilized natural resource. The objective of the present study is to describe the C source/sink status of customary managed grasslands of Imperata cylindrica var. latifolia (variety I) and *Imperata cylindrica* var. major (variety II) which are among the oldest forms of rural land use in Barak valley, North East India.
Method: Randomly soil samples from 0 to 25 cm soil depth were collected to analyze SOC and bulk density at monthly intervals. Soil C concentrations were determined by Walkley and Black's wet oxidation method. SOC stocks were calculated by multiplying the C content (%) by the bulk density and the thickness of the soil horizon (A).
C input to the soil from surface litter (B) and C input from necromass (C) were studied using standard method. Soil respirations, (D) were made at monthly intervals using the alkali absorption method of CO2 by soda lime.
Soil carbon budget (source/sink status) = (A + B + C) – D.
Result: SOC ranged from 17.9 g/m2/month to 22.4 g/m^2/month and 23 g/m^2/month to 25.8 g/m^2/month in variety I and variety II respectively. Carbon inputs to the soil from necromass and surface litter were the highest in August. Further soil respiration was estimated the lowest in December in variety and in January in variety II and soil systems in both varieties act as carbon source during February-June whereas it sink 76.5 gC/m^2 and 77.6 gC/m^2 during rest of the year.
Discussion and conclusion: Variety II proclaimed the higher SOC than variety I. These meant the higher organic matter incorporation and its lower erosion from the soil in variety II. Results exhibit immediate increments of SOC in March due to the addition of partially combusted charred material during the fire practice in March. Further fire burnt the surface litter and it resulted in no carbon input from above ground biomass in March. Monthly soil C budget proclaimed that soil of variety I added 87.1 g CO2 during carbon source months to the atmosphere whereas it removed 280.8 g of CO2 during its carbon sink months and caused a removal of 193.6 g CO2 in the year. But studies indicated that variety II grasslands exhibit better carbon sink quality of soil. It removed 216.9 g CO2/year from the atmosphere. Hence *Imperata* cylindrica var. latifolia and *Imperata cylindrica* var. major grasslands have its negative feedback to the global climate change.

P62-01 – S62 *Disrupted species interactions and cascade effects in human-modified landscapes*
17:30 – 18:30 – Joffre Area (Level 1)

Disrupted dispersal in logged tropical forest

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Selective logging in tropical forests is restricted to a few species, the so-called commercial species. Among those commercial species, many produce fleshy fruits of large size. These tree species provide food to a large number of mammals and birds that often exclusively rely on these resources. These mammals and birds may also be vital for the demography of fleshy fruit trees because they act as dispersers towards more suitable place for seedling establishment (directed dispersal hypothesis or colonization hypothesis), or they increase seedling survival by avoiding conspecific high densities (escape hypothesis).
Selective logging generally targets large trees, above the legal minimum cutting diameter, that also produce an important quantity of fruits to frugivores feeding in the canopy. Therefore, selective logging may impact frugivore populations in the long-term and in fine may disrupt the dispersal processes of logged species but not only. Indeed, selective logging of the largest - in terms of size and quantity -fleshy fruit producers may impact all fleshy fruit producers in decreasing the abundance of the resources hence creating local extinction of frugivores (the resource concentration hypothesis). Large frugivores feeding on the largest fruits may be more rapidly impacted. Until now studying the effect of logging is not an easy task because logging is generally correlated to hunting pressure.
Based on a multispecies comparison using data from a replicated experimental logged forest with various intensities (and including control plots) at constant hunting pressure, we test the effect of selective logging on seed dispersal of tropical forest trees. Seed dispersal will be estimated as a cluster size using Ripley's K functions. In particular, we will test if dispersal distances of fleshy fruit species in logged plots decrease compared to control plots. We hypothesize that animal-dispersed species with larger seeds are dispersed less far away in treated vs control plots than smaller seeded and non animal-dispersed species. We propose to take into account tree species with different dispersal syndromes i.e. tree species with different seed size among animal-dispersed trees, and tree species with different dispersal mode such as wind-dispersed, mechanically dispersed trees or gravity dispersed trees. We also propose to link the difference in dispersal between disturbed and undisturbed forest with the structural properties of the interaction network.